CASE 60116P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF

Bowers et al.

APPLICATION NO: 10/007,038

FILED: December 4, 2001

FOR: Soybean Cultivar S52-U3

CONFIRMATION NO: 2458

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RULE 132 AFFIDAVIT

I, Glenn R. Bowers, declare and state:

That I am a citizen of the United States and I reside at 2204 Indian Trails, Jonesboro, Arkansas 72401;

That I graduated from Blackburn College in 1975 with a B.S. degree in biology, from the University of Illinois in 1977 with a M.S. degree in plant pathology, from the University of Illinois in 1980 with a Ph.D. in plant pathology, followed by a year of post-doctoral study in soybean breeding at the University of Illinois;

That since 1981 I have been working in the field of soybean breeding serving from March 1981 until April 1998 as a faculty member with Texas A&M University and the state's public soybean breeder and from April 1998 to June 1999 with Purdue University and serving as the state of Indiana's public soybean breeder;

That from 1999 to 2004 I was employed by Syngenta Seeds, Inc. (Novartis Seeds) as a soybean breeder in Bay, Arkansas where I lead the project that develops mid Maturity Group IV through Maturity Group VIII soybean varieties for the company;

That I am familiar with the above identified patent application Serial No. 10/007,038 entitled Soybean Cultivar S52-U3;

That I am one of the named inventors of soybean cultivar S52-U3 and have personal knowledge of the genotypic and phenotypic characteristics of S52-U3;

That I have read and am familiar with US Patent Nos. 5,942,666 (the "'666 patent") and 6,084,159 (the "'159 patent");

That I have reviewed the testing data for soybean cultivar S52-U3 and for the following reasons have determined that the genotype and phenotype of the soybean cultivar S52-U3 is significantly distinct from that of the soybean cultivars 9392379521283 (1283 cultivar) of the '666 patent and the soybean cultivar 9524889614923 (4923 cultivar) of the '159 patent.

1. The 1283 cultivar of the '666 patent is resistant to *Phytophthora* races 1-9 (Column 5) resulting from the presence of the Rps1-k gene in its genome. In significant contrast, S52-U3 does not have any Rps genes in its genome. The table on page 17 of the S52-U3 specification refers to "tolerance" or "field resistance" and should not be confused with race specific resistance.

2. Full maturity in soybeans (Stage R8) is when 95% of the pods have reached their mature pod color. Five to ten days of drying weather are required after R8 before the soybeans have less than 15 percent moisture and can be harvested. Soybeans are photoperiod sensitive, meaning that their reproductive development cycle is mediated by day-length. A soybean plant will begin to flower after days become shorter than a critical length. This response is controlled by the plant's genetic constitution. The soybean germplasm exhibits a continuum of critical day-lengths for flowering.

Based on this response, a soybean variety can be placed into one of thirteen maturity groups (Maturity Group 000 through Maturity Group X). Each maturity group is further divided into tenths. A variety's Relative Maturity (RM) is represented as a two-digit number, significant to one decimal place. For example, a variety with a RM rating of X.0, is the earliest maturing variety within a given maturity group whereas a second variety with a RM rating of X.9 is the latest in that group. A one-tenth difference within a maturity group is considered significant in the industry. Commonly, a one-tenth difference in RM translates into a one-day difference in maturity. However, this can vary between environments and maturity groups. The Relative Maturity plant trait is so important to farmers that seed producers incorporate the Relative Maturity rating into the variety name ("S52-U3" indicates to a purchaser that the variety has a RM of 5.2). Farmers select the variety that will grow best in their area based, in large part, on the Relative Maturity rating of the variety.

3. The relative maturity of S52-U3 is significantly earlier than the relative maturity rating of 1283 cultivar as established by multi-year and multi-location trials. Tables 1 and 2 of the '666 patent show that the maturity date of the 1283 cultivar was compared with the maturity date of the Asgrow A5547 variety. The maturity date of the soybean cultivar S52-U3 was also compared with the Asgrow variety A5547 in our 1999 trials. The data shows that S52-U3 matured on October 8 and A5547 (RM=5.5) matured on October 11 (8 locations of data). This reflects a 3-day or 3/10th difference in relative maturity (RM). In the 1997 data as disclosed in Table 2 of the '666 patent, the 1283 cultivar is one day earlier in maturity than A5547. This would give the 1283 cultivar a RM of 5.4.

The 1283 cultivar was marketed under the variety name "AG5401". Thus, the variety AG5401 (the 1283 cultivar) was marketed as a RM 5.4 variety, confirming that the RM for this cultivar is as described in the '666 patent.

Furthermore, our data shows that S52-U3 is three days earlier than the Asgrow variety A5547, which would make it a RM 5.2, which is how S52-U3 is marketed. Thus, it is established that S52-U3 has a RM of 5.2, whereas the 1283 cultivar has a RM of 5.4. Clearly, a 2/10th difference in RM is significant by industry standards.

Although it is true that the environment can change the days to maturity from trial to trial, the data from multiple trials, when taken together, take into account the environmental differences and

allow those skilled in the art to differentiate between complex traits. Furthermore, while the calendar date for maturity can change in different environments, the relative difference between the maturity of any two varieties is fairly constant.

4. The relative maturity of the soybean cultivar S52-U3 is significantly earlier than the relative maturity rating of 4923 cultivar of the '159 patent. The data presented in Table 1shows that the cultivar 4923 is 1 (AG5901) or 2 (AG5959) days later than RM 5.9 lines, 2 days later than a RM 5.8 line (AG5801), and 5 days later than a RM 5.6 line (AG5602). This information, taken collectively, clearly indicates that the 4923 cultivar is either a RM 6.0 or 6.1. The 4923 cultivar was marketed as CSR6002N and thus advertised as having a RM of 6.0. Therefore, based on the data contained in the '159 patent specification and the published information pertaining to the '4923 it is clear that the soybean cultivar S52-U3 has a significant earlier RM than the 4923 cultivar.

That the undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

September 29, 2004
Date

Glenn R. Bowers
Glenn R. Bowers

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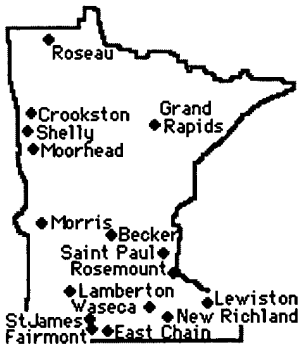
Variety Trials of Selected Farm Crops

Variety Trials
Soybean



Locations of soybean trials.

Successful crop production depends to a considerable extent on selecting the best varieties for a particul farm. For that reason, varieties are compared in trial plots on experiment station fields at St. Paul, Rosemount, Waseca, Lamberton, Morris, Crookston, Grand Rapids and Becker, and on farmers' fields. Important old varieties and new varieties are grown in replicated plots at each location. These plots are handled so that the factors affecting yield and other characteristics are as nearly the same for all varietie each location as is possible.

Variety Classifications

Varieties are classed into groups under headings such as "recommended," "not adequately tested," "spec purpose," etc. Varietal descriptions are arranged alphabetically within groups. "Public" and "private" designations are also attached to some group headings. Classifications of varieties as "recommended," "other" and "special purpose" are determined each year by the Experiment Station Crop Variety Review Committee. A variety is usually not "recommended" unless it has been better than other varieties in important characteristics in three years of testing.

Varieties from other public experiment stations and private plant breeders not sufficiently evaluated her are listed as "varieties not adequately tested." Available information is presented, but no conclusions are

Table 1. Genes for resistance to races of Phytophthora root rot (bullet indicates resistance).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Rps1	•	•								•	•		•		•	•	•	•						•		•
Rps1b	•		•	•	•	•	•	•	•				•	•	•		•	•			•	•				
Rps1c	•	•	•			•	•	•	•	•	•		•		•		•				•		•	•		•
Rps1k	•	•	•	•	•	•	•	•	•	•	•		•	•	•		•	•				•	•	•		•
Rps3	•	•	•	•	•			•	•		•		•	•		•		•					•		•	
Rps4	•	•	•	•						•		•	•	•	•	•		•	•	•	•				•	
Rps6	•	•	•	•						•		•		•	•	•		•	•	•	•				•	

Some information refers to "tolerance" or "field resistance" which is not race-specific and should not be confused with race specific resistance. Reliable tests for tolerance have not yet been developed.

The genes present were determined based on data from greenhouse plants grown by scientists in the University of Minnesota Department of Plant Pathology, and on information supplied by the companies. *Table 1, which details the race resistances provided by the various genes, is significantly revised from p years, incorporating two new races of the fungus and revising the race resistance information for severe the genes.*

Soybean Cyst Nematode--SCN was first identified in Minnesota in 1978 and continues to spread. It is known to occur in 35 Minnesota counties, according to Cooperative Pest Survey Program data. Areas infested and numbers of nematodes both appear to be increasing. When SCN numbers are high, signific yield losses can occur. Several races of SCN are known to occur in Minnesota. Rotations tonon-host cro and planting resistant varieties assist in managing nematode populations.

Results of a special performance test of public and private varieties resistant to soybean cyst nematode a provided in Table 9. These trials were conducted on "infested" sites near East Chain, Waseca and St. Jar and on "non-infested" sites at Fairmont, Lamberton and Waseca.

Additional details on the soybean cyst nematode and management of infested fields can be found in the publication The Soybean Cyst Nematode (AG-FO-3935), 1990, Minnesota Extension Service, Universit Minnesota. It is not available electronically. It is available from Minnesota County Extension offices or Distribution Center, 20 Coffey Hall, 1420 Eckles Ave., University of Minnesota, St. Paul, MN 55108-6(

Brown Stem Rot--Brown stem rot is a fungal disease that can cause yield losses in certain situations. Tl disease occurs most frequently when soybean follows soybean, but can also occur where soybean is plar every other year. Resistant varieties, or longer rotations out of soybean, assist in the management of this disease. See text descriptions of public varieties for information about their resistance to this fungus.